Document ID Number: 2053
AR: Montrose Settlements Restoration Program Administrative Record
Title: MSRP Scientific Review Board Meeting

Montrose Settlements Restoration Program
Scientific Review Board Meeting
Long Beach Hilton Hotel
November 7, 2001

Attendees:

SRB: Jim Allen (SCCWRP), Ann Bailey (EcoChem), Bob Brodberg (OEHHA), Mark Gold (Heal the Bay), Rich Gossett (CRG), Joe Meistrell (LACSD), Dave Montagne (LACSD), Harvey Motulsky (GraphPad), Ken Nielsen (Seaventures), Fred Schauffler (EPA), Steve Schroeter (UCSB), Jan Stull (former LACSD), Alyce Ujihara (CA Dept. Health Services), Patty Velez (CA Fish & Game)
NOAA: Kolleen Bannon, Jennifer Boyce, Pam Castens, Bill Connor, John Cubit
CH2M Hill: Maggie Fitzgerald, Harry Ohlendorf
IEc: Michael Donlan, Ann Jones

Not present: Rich Ambrose (UCLA), Dennis Bedford (CA Fish & Game), Guang-Yu Wang (Santa Monica Bay Restoration Project

Meeting

1. Introduction (Mike)
2. Objectives (Mike)
3. Project Definition (John)
4. Review of Questions (John)

History of Sampling in Palos Verdes area

Multiple sites & sampling approaches. For Montrose case tried to bring all the data together.
(Get slides from John Cubit)

Pollutant Distribution

- 1970: sand (mole) crab measurements. White's Point Outfall is huge spike. San Joaquin low, but still 100 ppb.
- 1970-1995 QEA : DDE in Mussels at Palos Verdes. Exponential decay after Montrose discharge cessation. Fairly level since 1983. Diffusion/perturbation are current sources.
- DDT concentration in sediment on Palos Verdes Shelf (LACSD map) is high near outfall. Much lower to south than north. currents carried plume north.
- Southern California Bight project – DDT in surface sediments (from cores). Still much higher on shelf, next farther north. (PCBs, too, but they travel with DDTs)
- Vertical distribution – highest concentration around 30 cm, cleaner sediments above. Unknown – what if there is surface erosion? (why they're looking at capping) Recent indications of flux of DDT and erosion. Fred and LACSD particularly concerned.
- Looking at different fish types: pelagic, water column feeder, bottom feeder.
- (discussion of FDA vs. EPA threshold levels)

- Pelagic (mackerel): low in DDT, below 0.1 ppm "trigger" based on 1987 OEHHA sampling
- Water Column Feeding (kelp bass): above trigger just off outfall
- Bottom Feeding (White croaker): more above threshold. Doesn't roam large distances like the mackerel. Santa Monica Bay still has fish above trigger level (north of outfall).
- When OEHHA sent some of these in for checking, found that there was under-extraction outside the area of the outfall, probably low by a factor of 3. Jerry Pollack thinks Santa Monica Bay levels may be high.
- (All these data are LACSD and OEHHA. Montrose defendants did some testing as well, got lower levels, but it doesn't change the patterns. Jerry Pollack ? also thought there were QA/QC problems with the Montrose defendants data.)
- LACSD – individual fish, OEHHA – composites, muscle fillets w/o skin. Dorsolateral fillets.

White Croaker Eaters in LA area

- Allen, Velez, et al. 1991-1992
- 88% non-white; nearly 60% Hispanic; 7% Asian, 19% black.
- Income: 39% < $25K, 42% refused answer.
- 82% fish from piers, 14% private boats, 4% party boats
- 71% eat whole fish (whole or whole gutted)
- eating whole fish is about 2x contamination compared to fillets

Fishing Restoration

- Clean fish for sports fishing, subsistence fishing. (goals: bring clean fishing to anglers or let them know where to find the cleaner fish)
- EPA/Trustees activities: EPA: *reduce risks* from DDTs and PCBs still in the environment; Trustees: *restore resources* harmed by DDTs and PCBs, highest priority to raptors and fishing resources that continue to be injured.
- Map of fishing advisories Santa Monica Bay, Redondo Beach, Palos Verdes, Long Beach Harbor, Newport Beach. 8 local fish species or species groups have limited consumption advisories. Also catch limit for white croaker. Commercial ban is on white croaker only.
- ("no, we don't eat croaker, we eat kingfish" – Ken Nielsen talked to local fishermen this morning at nearby pier. Warning pictures up were not good depictions of white croaker.)
- Newspaper articles: difficult to use to decide where to catch fish. Tend to tell you not to eat fish, rather than where it is safe to do so or have incomplete information.
- Jim: perhaps show list of pictures, both good to eat and not good to eat.
- Harvey – how many people fish here? Fred – 1980 estimated 10,000 individuals (per year?)
- Ken looked at tackle – these people fish **a lot**
- John – Fishing goes on night and day around here. If surveys only conducted during normal working hours, they miss a lot.

- **Goal: "smart fishing"** good reliable information on which fish to catch and where to catch them. Make sure anglers have a source of clean fish.
- **Possible Projects:** construct artificial reefs at fishing areas, both attract/produce clean fish and displace more contaminated fish; make bigger and better coastal wetlands to produce more clean fish.
- Local piers: all soft bottom. Reefs would keep white croaker off to sides, bring in the rocky bottom fish.
- Engineering questions: Jan – have the coastal engineers looked at this? Effects of sand, erosion, upwelling of sand in a storm? John – well, we might even end up building new piers if there are better places to put in the reefs. Dennis has information on this. This is all stuff that needs to be considered. Are kelp beds a good thing? Keep away from pier to prevent getting fishing gear tangled up.
- Reef locations: John showed chart of possible locations. Santa Monica and Venice piers, Marina del Rey breakwaters, etc., King Harbor. (Ken – all these areas have some hard bottom nearby) These are ideas for where we might sample. **Get from John - send out to board?** These locations were selected during litigation, as potential locations for restoration projects. Trustees had this in their pockets for the litigation process. Trying to shift the fish types at some places: these areas were selected because they have some current advisories. Might run out of onshore places to try, so they have offshore as well.
- **Wetlands Enhancement Projects**: not part of this fish sampling plan.
- MSRP wants to choose projects that most directly and effectively restore sustainable clean fishing.
- **SRB Process**: immediate need for evaluation of reefs as possible restoration projects, design a survey of DDTs and PCBs in subsistence and sport fish in LA and Orange counties.
- **Longer term need**: advise additional surveys and restoration planning.
- Probably want to include these surveys in the next Bight-wide surveys.
- How can we use other data or "dove-tail" with other sampling to complement ours?

The SRB Process

1. Brainstorm survey design
2. Members take home action items to accomplish
3. Products go to CH2M Hill to assemble whole plan
4. Sampling plan for initial survey
5. Final core sampling plan usable for all of fishing restoration planning (core: as in central, can be expanded, modified, etc.)

Questions on plan

- Bob: time frame? for how long the sampling plan will extend? John: part of design is developing the monitoring plan. This doesn't have a specific budget for sampling. All mushed in with restoration projects, not even split up fish vs. bird. Bill – the restoration planning process will allocate to the different parts, but need better estimates of costs to begin.

- Dave – when will this plan be done? John – by early next year. Of course, we might decide that summer is the time to do the collections.
- Steve – there will be some design that will put in hard bottoms? (John – that's a maybe – depends on how close to Palos Verdes we could put in good fishing.)

Risk Discussion

(a) DHS: trigger level (100 ppb for DDT) gives 10^{-5} cancer risk for a lifetime of consuming fish at 17.5 g/day based on animal models.
(b) OEHHA: if you eat a lot of fish, it's a risk of 10^{-5}
(c) Cumulative risks not considered in advisories.
(d) Can we put forth the plan in such a way that encourages fishing and the livelihood of local fishermen?
(e) Current goal is to figure out if we can put in reefs close enough to Palos Verdes to be useful.

Data Collection Problems

The data that already exist are either too localized (e.g. LACSD) or there are older collections (fish levels have changed, analytical methods and standards have changed.) What's needed is a comprehensive collection where we can really trust sampling to be bias-free and good QA/QC on chemistry and fish collection. Need strong scientific basis to justify, since this may get challenged in court. Sites, species, sample sizes, number of samples, questions addressed, contaminants analyzed, all need to be defensible. Blind standards, verify accuracy of analysis. Need high degree of confidence in order to release to public and for our own resource decisions. Please correct John on any mistakes/ bad assumptions he makes – and he'll do the same.

Handouts

1. Design Questions for the SRB
   - excerpted from earlier handout.
2. "Sport and Subsistence Fish Caught in LA County from Shore (Jan 1980 to Oct 2001)"
   - Only fish that samplers actually saw and counted; not total catch.
   - Only shore anglers – beaches, piers, jetties, and only for LA County.
   - Data also available for different boat types, etc. from RECFIN database
3. "Demographic Variability in seafood consumption rates among recreational anglers of Santa Monica Bay, California, in 1991-1992."
4. "While a Rich Source of Protein, Fish Also Poses Potential Risks" LA Times

Afternoon – Review of Questions

Mark Gold is now present.

Question Teams for SRB (group leader in bold):

Q3,4,5 (and fish sampling location planning)
Steve, Alyce, Ken, **Jim**, Rich A., Patty, Jan, Bob, Dennis

Q 2,6,7,8
Bob, Jim, **Rich G.**, Alyce, Steve, Fred, Dave, Mark, Guang-Yu
Q9,10
Ken, **Ann,** Rich G.
Q11-14
Harvey, Bob, Steve, Rich G.

Questions below are those reviewed at the meeting, with additional aspects to consider enumerated below each question.

1. If reef type fish show levels less than the trigger level, is that a good place to put a reef?

(a) Is there an agency willing to state that an area is safe and recommended for fishing, or does this goal need to be reworded?
(b) Further studying of trigger levels.

2. What other contaminants should be sampled?

(a) Can we avoid analyzing PCBs in all fish based on an assumption of covariance with DDT?
(b) What contaminants are generally a concern with near-shore, smaller fish?
(c) Reference: SWRCB yearly studies: (http://www.swrcb.ca.gov/programs/smw/index.html)
(d) What are there CA trigger levels for? (Bioaccumulative toxins, generally)

3. Geographic resolution

(a) Better picture of LA Harbor in general would be useful.
(b) Can sample at places other than existing piers.
(c) When do we bring in the engineers?
(d) What if fish come to reef from contaminated areas? How do we estimate their contamination?
(e) Can we refine sampling areas based on gradients in current studies?
(f) RECFIN estimates fishing demand by site

4. What species should be sampled?

(a) What fish substitutions can be made?
(b) How fine do species divisions need to be?
(c) Consider lobster and crab hoop net fishing, urchins, mussels.
(d) Restrict to shore-based fishing.

5. How often to sample? seasonally, yearly? (for first survey)

(a) Is there seasonal variation? Is it enough to worry about?
(b) How do fish body burdens vary seasonally?
(c) What are the seasonal patterns of fishing and of fish presence?

6. Dovetailing with other projects, i.e. SCCWRP

7. Can sampling be part of EPA's efforts?

(a) Considered not to be a major part of current considerations; don't want to collect esoteric data that aren't useful later.
(b) Interaction with the EPA Education Taskforce

8. Tissue sampling

(a) Consider the varied consumption methods - stocks, stews, whole gutted fish.
(b) Try to develop relationship between whole gutted and fillet. (Alyce - SF Bay study)
(c) What cooking and cleaning methods are common vs. what is considered in OEHHA best practices for removing contaminants?
(d) Skin consumption?
(e) Data on different parts of fish, cooked vs. raw.
(f) How should fish be cut up?

9. Selecting labs to analyze tissues

10. What QA/QC procedures?

(a) External blind references requested by John

11. - 14. What are adequate sample groupings and sample sizes of fish for contaminant analysis?

(a) Need to differentiate between one hot fish and a bunch of cold vs. a lot of lukewarm
(b) Can we have cheaper screens that are indicators for doing more specific testing?
(c) Temporal studies to average out transient fish?
(d) EPA has guidance documents on this process.

15. How will the data be organized and analyzed?

(a) Need to define database structure and manner of presentation of results.

16. Additional Questions/Issues

(a) Where will fish be caught? from piers? from boats?
(b) What sorts of independent observers are required?
(c) Can we collect extra fish? How long can we hold them?
(d) Does old frozen fish change in wet weight or contaminant concentration?
(e) Any approval process required for obtaining and killing the animals?
(f) Will this require setting gill nets?
(g) Any permits needed for the sampling should be mentioned in the sampling plan.

More complete transcript of meeting:
Risk Discussion:
Harvey – any guesses on the risks? Alyce –(so we're talking 10^{-3} if it's 100x trigger level) Fred – this is based on families catching fish on a weekly basis. Fish concentrations are expected to be above trigger level over next century if no work is done. Bob –. (Are these different OEHHA numbers? or does it refer to the 17.5 g/day Alyce mentioned?) Jim – Santa Monica Bay Restoration Project study, one meal of contaminated fish gives you a 10^{-5} risk. (once only? repeated dosage?) Ann – for individual toxins? yes, but these are additive risks. Ken – how do you compare to other risks? Bob – analysis of comparative risks. Ken – general public thinks all fish are contaminated, hurts fishermen a lot; we should make a good statement about where to fish and try to ameliorate economic damage to local fishing. John – even the white croaker are safe in some areas.
Ken – Bight'98 survey – caught a 20 lb. halibut – biologist with them didn't know it wasn't contaminated.
Rich – is one of our goals to fill the gap of what / where can be eaten? John – now we're trying to figure out if we can put in reefs close enough to Palos Verdes to be useful.
Dave – how do we define clean? slope factors for cancer risks? do we include other contaminants (e.g. mercury)? wants to make sure we don't say it's clean, and then the state comes back in 10 years and says, nope, you can't eat that, we've redone the risk assessments. John – this is part of what we look at. What if rockfish are high in mercury? Is the state threshold the right number to use? Hg levels around here are pretty low, but there hasn't been much testing in the area. LA Times – King mackerel high in Hg, but those aren't the mackerel here, they're in the Gulf area, SE coast. Bob got lots of calls, mainly consumers, asking questions about commercial fish purchasing.
Trustees don't deal with health issues per se – they deal with resource impacts and the recreational value. Health issues obviously impact this, but it's not the central focus. How to collaborate to address these issues is part of project.
Jim – articles don't focus on where fish are O.K. to eat, too generic warnings.

First, anything people want to add?

Bob – what is relationship between this information being gathered and OEHHA's function in issuing state fish consumption advisories? Is this something separate? are the Trustees/the SRB issuing our own advisories separate from what OEHHA would come up with?
John – we are trying to answer where we could build something to make less contaminated fish. what we need and want from you is how these data would be used, what non-contaminated would mean, how clean the fish need to be. If there are two ways, and one is useful for OEHHA, that's the way we want to sample.
Joe – asking how many different groups put out advisories? John – not Santa Monica Bay Restoration Project, not Montrose Settlement Restoration Project, not Heal the Bay, only OEHHA. We want OEHHA to put out the advisories.
Bob – looked back at last time, some places are theoretically clean based on standards, would need to be retested, but OEHHA doesn't go around saying "this place is safe to

fish"; don't want the liability of saying that. (John's comment) If we can't do that, it will really affect how we go about this.
Bob – what we say is "fish have been sampled here and no advisory is necessary for fishing in this area for a frequent fisher."
Mark – is there a plan where Santa Monica Bay and San Pedro Bay will come up in the next few years to be doing an assessment? (legislature – bill passed: "Contaminated Fish Bill")
Bob – Susan Klasing has been working on Santa Monica Bay information trying to put together a write-up which would determine whether to revise advice. This is a long project – Susan doesn't work full time and this is not top priority. Need to see how data sets can be merged?
Mark – glad to see EPA here. EPA working with DHS on advisories, can they help expedite this review process? get money from EPA to accelerate this process, help Susan look at more data?
Fred – EPA wants to help CA generate its own advisories. What if level is above 100 ppb, are the fish clean? EPA wants to collect data on white croaker outside of ban, generate data for OEHHA, find out if catch ban doing what it needs.
Mark – can't just give data to OEHHA, need to give them money for consultants as well.
Fred – willing to consider that. For recreational advisories, not sure that they'll provide too much useful data. Also, wouldn't look at unrelated contaminants.
Joe – LACSD is gathering data on species subject to fish advisories
Jim – California is doing fish study (more info? which study does this refer to)
John – redirect discussion
What levels would we use to determine if fish are sufficiently clean to catch? State trigger levels? Bonito, mackerel are low enough, is anyone willing to take a stand that you should be eating those.
Rich – is there a commercial fishing component? That's technically outside trustee's responsibility – state/EPA problem. Could be combined with sampling plan, but requires initiative and funds from EPA or State.

1. If reef type fish show levels less than the trigger level, is that a good place to put a reef?
Bob – there are other screening values that have other definitions than being a magical safe level. EPA has these in their guidance for fish contaminants. OEHHA has them too. Not defined as safe level: defined as levels above which one should gather more information to do a health evaluation, or if you have enough information you should update them to be sure they are good numbers. Bob has these values. DDT: 100 ppb, PCB (congener concentrations translated into Aroclor values): 20 ppb (lower since you used to not be able to determine 20 ppb).
John – if there is no o.k. level, then there is no use going on.
Is anyone willing to state publicly that fish are safe?
Maggie – can we break this down and see which contaminants have determinable levels?
John – to provide anglers with "safe" fish, is there anyway to define this?
Bill – we want to do this from the other way – where is it a good place to fish.
Alyce – the screening levels assume 2 meals per month. It would be much lower if you included subsistence fishermen.

Fred – let's send this to a subgroup.
John – yup, we don't mean to answer these right now.
Steve – if you know conc. distribution in Bight, develop method for translating into risk. this develops a metric. can plot different contaminants, know where reefs will provide most impact. i.e. if you lower PCB 2 units and raise mercury 1 unit, provide metric for determining if that is an overall gain.
Mark – is it a foregone conclusion that the mitigation for the loss to the public will be through a constructed reef?
John – no, the main purpose now is to determine if a reef would be a feasible project. wetlands, education, hatcheries. this gets discussed elsewhere, since this initial sample is being directed at the feasibility of reefs, keeping in mind it is first stage in larger sampling plan.
Mark – new pier in a cleaner place, hatcheries, when are these considered?
Bill – gets considered in restoration plan.
Steve – wouldn't this help us evaluate other alternatives, too?
Mark – reefs **are not** an in-kind replacement.
John – did preference questionnaire on different fish types. Many people just want white croaker.
Pam – Board should keep in mind any alterations to sampling plan that would consider these other concepts.
Rich –who is the audience for the restoration?
John – pier and jetty fishers at this point. from trustee point of view, w/out further input from state health agencies and EPA, no restaurant, no health, all recreational
Steve – is it a surf fish?
Jim – no, not caught from surf
Bob – this is a Superfund site, not what he/OEHHA does. additive risk isn't part of OEHHA. "Frequent fisher" is where their advisories start – 3 meals a week. (8 oz meals, about 97 g/day) If there's no risk, they just don't say anything. Average chemical concentration is used. 70 year lifetime assumption, might be amortized 30/70.
Alyce – for subsistence fisher, what threshold are we looking at?
Bob – these are just conservative levels, so we know where to start looking at making health advisories. Need to do an adequate amount of sampling before you could recommend an area. Santa Monica Bay program was great. 20 fish/site. 5 composites of 4 fish each. Sample more than one year to get a mean of what people eat, but can't sample over a 30 year period for one project.
Mike – aren't we looking for geographic extent required for sampling? there's an extent beyond which people aren't going to go.
John – How would we process these data? (goal – rational basis for making determinations on whether reefs are viable as part of restoration)
Dave – white croaker are really the last fish we're interested in sampling.
John (?) – conclusion is that some fish in many areas are below the screening levels, so can move forward and do more evaluation of fish in various areas.
Bob will give Harry the screening values.
And on to question #2.
Ann – can we not analyze PCBs based on assumption of covariance? it's a lot cheaper to analyze DDT. (general assumption –no, but needs to be justified.) [would there be a way

to not analyze as much for PCBs – i.e. one for every five DDTs?] ***action issue for Rich G. and Ann***

Joe – What contaminants are a concern with near-shore, non-huge fish?
Bob – mercury is a reasonable concern.
John – who is good to answer this questions – who has the data? i.e. reference for why to sample mercury.
Jim – chlorinated hydrocarbons and metal contaminants up and down the coast have been studied. State Water Resources Control Board. OEHHA oversees, Fish and Game is collecting the fish. Yearly study. (http://www.swrcb.ca.gov/programs/smw/index.html)
(Jim, Bob to put together rationale for analyzing mercury and provide to CH2M Hill; Rich to do for chlordane, tributyltin; Ann to determine if it's feasible to do lots of things that are all the same analytical method. Bob's database can't be only source, since they already make presumptions on the highest contaminants in the area.)
Mike – what are there CA trigger levels for?
Bob – trigger levels for bioaccumulative toxins for fish. e.g. lead isn't tested for because it's just not an issue.
Jim – generally metal accumulation isn't a big problem in fish.

3. Geographic resolution

Do we need more site-specific data?
Jim – look at piers from N. Santa Monica Bay down to Orange County. Want better picture of LA harbor in general.
John – don't just look at piers, since we could build new piers.
Joe – between Marina del Rey and Palos Verdes all the pier slots are full, so you know where to sample (i.e. at existing piers).
John – this doesn't consider engineering feasibility
Jan – when do we bring in the engineers?
Jim – what if the fish come to the reef from contaminated areas?
Rich – how do we estimate whether the fish that come in will be clean? what sort of correlation to extant fish?
Steve – any insight into spacing from the data already available?
John – yeah, and we know what limitations are on current data.
Steve – so if gradients are very sharp, we sample more frequently, lower gradients, then sample larger areas.
Alyce – RECFIN data has fishing pressure code by site that should be help select where to sample. (http://www.psmfc.org/recfin/) Tells how many people fish there at different times. Has a name of the guru out of Fish and Game who does local RECFIN.
Subgroup: (John, Steve, Alyce, Harvey, and the guru)

4. What species should be sampled?

Jan, Ken, Jim, Patty, Alyce (& guru). Also answer what substitutes for what or can serve as a representative for a group of species, which species are similar enough so they can be combined, how many types of a group (e.g., rockfish) do you consider? Ken - Hard-bottom habitats/reefs will bring in lobster and crab hoop net fishing. Jim – this affects what contaminants we look at (e.g., may need to analyze for inorganics in shellfish). Still restricting to shore-based fishing. Urchins, mussels. Need to look at newer data.

5. How often to sample? seasonally, yearly? (for first survey)

Is there seasonal variation, is it enough to worry about? Seasonal patterns of fishing and of fish presence. (combine with 4, maybe someone from OEHHA - Bob). How do fish body burdens fluctuate seasonally?

6. Dovetailing with other projects, i.e. SCCWRP

Steve Schweisberg? from SCCWRP can give some hours, State project – SWRCB – Val Connor, Del Rasmussen.

(SCCWRP, Del, Bob, Rich, Fred, Dave, Jim)

7. Can sampling be part of EPA's efforts?

Since our priority right now is reef feasibility, just keep in mind that we shouldn't collect esoteric data. EPA education taskforce should be contacted.

Bob – seems like sampling is going to be everywhere but on the Palos Verdes shelf. Fred will be sampling on the shelf and the edges. (same group as #6)

8. Tissue sampling

John – almost all sampling to date for human health concerns has been muscle filets. Many fishers of concern eat cioppino, court bouillon, whole gutted fish, etc. LACSD certainly isn't going to change the way they've been sampling for 30 years. Can we analyze filet and whole body, determine if there's a relationship btw. the two, in order to determine how it fits into overall body of data. Also will determine what the disparity is in dose to the angler depending on prep method/ cooking.

Alyce – SF Bay, 40% lower with skin off. get study

Bob – advisories are based on using the recommended cooking and cleaning methods – filets, that's why they suggest it, because it removes contaminants. **do they have studies on this?**

Rich – "their primary method is frying. only thing left is the skin."

Alyce – studied eating of white croaker, about half eat the skin.

Mark's data set? Heal the Bay study? (executive summary: http://www.healthebay.org/buyerbeware.asp)

Rich – DDTs migrate into oil when you fry with the skin on. (says he has study)

Maybe give lists of how you would reduce risks? % due to different procedures.

Mark – do both whole and filet so that you can appease both sides of argument.

Ken – can you sample the cooked food?

Rich – can bring data on different fish parts as well.

(Mark, Rich G., Alyce, Ann, Steve, Jim)

Mark – maybe have days of meetings on specific topics (or conference calls) bring your references, etc.

9. Selecting labs to analyze tissues?

CH2M Hill, IEc, Rich, Ann.

10. What QA/QC procedures?

same committee. John's thing is external blind references. Rich just did something on this.

11. – 14. What are adequate sample groupings and sample sizes of fish for contaminant analysis?

John - want to know whether there is one hot fish and a bunch of cold, or a whole lot of lukewarm.

Harvey – is most of the cost catching the fish or doing the chemistry? general consensus – it's the chemistry.

Steve – can we have cheaper screens that are indicators for doing more specific testing? or can we get around this by doing temporal studies? to average out transient fish?
Mark – more important that Fred/EPA samples individual fish than for the reef study.
Alyce – EPA has guidance on this.
Rich's study for Mark – did groups of 30, 5 individual, other 25 in composites.
Alyce – Size class issues?
Ken – when we did studies in the past, lots of kelp bass. Lots of big ones, ground everything up. 5 lb. calico bass is an old fish - could pick up lots of contaminants. (Harvey, Bob, Steve, Rich, John)
Mark – started with OEHHA, EPA guidance, worked with Rich to modify it to answer the questions they had. Wants us to rely on other groups' research plans to start on ours.
Dave – how we cut up the fish. resection. (Ken – different ways to prepare a whole fish.)
John - Has to take into account what fish are actually available. Fish populations are not constant. Variance with size, sex. Discuss under q 4. and q. 5. Need to get/use EPA guidance for fish advisories as a start.

15. How will the data be organized and analyzed?

Database needs to include all important measurements/data (e.g., location, size, sex, etc.; CH2M Hill to consider/address needs.)

16. What additional questions are missing?

Mark – where are we catching fish? from piers? from boats? how?
John - what sorts of observers? need observer on boat?
Dave – since we are looking at replacing white croaker, we'd need to catch the fish elsewhere.
John – look at RECFIN database, find sizes of fish caught, etc. Don't want a sample that is biased towards things the pier fishers don't catch.
Harry – Sampling plan will need to specify fish collection methods, so that we know target species, size, etc.

Other questions/issues:

Can we collect extra fish and archive them? How long can we hold them?
Does old fish change in wet weight? Do concentrations change?
John - wants decisions based on actual study, not the guidance document.
Ann – find the NIST reference on old tissue samples as standards. Uses tissue samples sealed in ampoules.
Harvey – any issues with the collection process, and getting approval for killing the animals?
Jim – Will this require setting gill nets or anything like that? (Ken - if it's within 200 ft of pier, you'd probably need to close the pier)
Sampling plan must mention necessary collecting permits;CH2M HILL to work with Patty on that.
QA/QC issues – Ann's and Rich's help needed on Quality Assurance Project Plan to cover details.